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S/080/51/034/000/17520009
D204/D305

The vulcanizing activity of ...

the sulphenamide compounds the slower the speed of vulcanization. There is still insufficient data to decide whether the reaction proceeds by a radical or bimolecular mechanism and this makes the exact role of the R' and R'' radicals hard to determine. The exchange reactions studied here may be used for the synthesis of sulphenamide derivatives of 2-mercapto-benzothiazole with a labelled radioactive sulphur atom. There are 2 figures, 4 tables, and Soviet-bloc references. 4

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i fiziko-khimicheskoy imeni L.N. Karpova (Scientific Research Institute of the Tire Industry and Physico-Chemical Institute im. L.N. Karpov)

SUBMITTED: June 24, 1960

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GOL'DSHTEYN, I.P.; GUR'YANOVA, Ye.N.; DELINSKAYA, Ye.D.; KOCHESHKOV, K.A.

Dipole moments of organotin chlorides and their complex-forming ability. Dokl.AN SSSR 136 no.5:1079-1081 F '61. (MIRA 14:5)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova. 2. Chlen-korrespondent AN SSSR (for Kocheshkov).

(Tin organic compounds---Dipole moments)

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S/020/61/138/004/013/023
B103/B203

AUTHORS: Gol'dshteyn, I. P., Fayzi, N. Kh., Slovokhotova, N. A.,
Gur'yanova, Ye. N., Viktorova, I. M., and Kocheshkov, K. A.,
Corresponding Member AS USSR

TITLE: Complexes of diphenyl ethylene with tin tetrachloride and
organo-tin chlorides

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 4, 1961, 839-842

TEXT: The authors studied complexes of asymmetric diphenyl ethylene (DPE) with SnCl_4 , $\text{C}_6\text{H}_5\text{SnCl}_3$, and $(\text{C}_6\text{H}_5)_2\text{SnCl}_2$. The catalytic activity of SnCl_4 is explained with the formation of π -complexes with monomers without ever clarifying the nature of these complexes. The authors studied then by (A) infrared spectra, (B) electron spectra, and (C) dielectric polarization. In previous papers (I. P. Gol'dshteyn et al., Ref. 4: DAN, 136, No. 5 (1961)) it had been found by method (C) that the mentioned compounds formed a series according to their capability of forming complexes with dioxane: $\text{SnCl}_4 > \text{C}_6\text{H}_5\text{SnCl}_3 \gg (\text{C}_6\text{H}_5)_2\text{SnCl}_2$. The authors tried to find out whether or

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not this series was also maintained in complexes with monomers. The following systems were studied: (a) $\text{SnCl}_4 + \text{DPE}$, (b) $\text{C}_6\text{H}_5\text{SnCl}_3 + \text{DPE}$, (c) $(\text{C}_6\text{H}_5)_2\text{SnCl}_2 + \text{DPE}$, (d) $\text{SnCl}_4 + \text{DPE} + \text{DPE-dimer}$, and (e) $\text{C}_6\text{H}_5\text{SnCl}_3 + \text{DPE} + \text{DPE-dimer}$. (A) The spectra were taken with a split-beam spectrophotometer M-800 (N-800) with fluorite cuvettes and Teflon insertions ($20\ \mu$). The mixtures were prepared in an airtight chamber in dry nitrogen and filled into cuvettes. SnCl_4 and $\text{C}_6\text{H}_5\text{SnCl}_3$ in DPE give green solutions with an absorption band $610\ \text{m}\mu$ and an intensive absorption below $500\ \text{m}\mu$. (B) The electron spectra were taken with an $\text{C}\Phi\text{-4}$ (SF-4) spectrophotometer in benzene solution. Results of (A). As compared with the spectra of pure DPE, the spectra of systems (a) and (b) show considerable changes: (1) The bands of the region 1612 , $1420 - 1400$, and $1335\ \text{cm}^{-1}$ disappear, the intensity of the band $1578\ \text{cm}^{-1}$ decreases strongly. They are all connected with the double bond in the molecule of diphenyl ethylene. The band $1615\ \text{cm}^{-1}$ belongs to the stretching vibrations of the $\text{C}=\text{C}$ double bond whose frequency is reduced owing to the conjunction with phenyl rings. The bands 1400 and $1330\ \text{cm}^{-1}$ belong to the deformation vibrations of the methylene group on the double bond. The band $1578\ \text{cm}^{-1}$ belongs to the vibrations of

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the phenyl ring. Its intensity increases strongly due to the interaction with the conjugate double bonds. (2) New bands appear in the regions 1376, 1250, and 1220 cm^{-1} . (3) The band 1605 cm^{-1} of the benzene ring vibration is slightly shifted, and its intensity increases. Besides, the authors measured the spectrum of the solution of the DPE dimer in DPE to prove that the above-mentioned changes (1)-(3) are not connected with the appearance of the dimer in the above systems. This spectrum shows two additional bands which are absent in the spectrum of the monomer. The band 1665 cm^{-1} belongs to the stretching vibrations of the C=C bond in the dimer. The band 1285 cm^{-1} possibly belongs to the CH deformation vibrations on the double bond. None of these two bands appears in the spectra of systems (a) and (b). The authors consider this fact as a proof that the changes (1)-(3) in the infrared spectra are not caused by the dimer but by the intermediates of the interaction of DPE with the tin halides. Further spectral data suggest that the dimer also forms complexes with SnCl_4 and $\text{C}_6\text{H}_5\text{SnCl}_3$. (C) The authors measured the dipole moment of DPE in benzene solution with excess SnCl_4 , and obtained the value 1D. Thus, it lies by 0.7-0.8 D higher than the dipole moment in benzene. For these reasons, the

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authors think that the band 480 μ (contrary to statements made by A. G. Evans et al. (see below)) cannot be explained with carbonium ions. The absorption band in the region 610 μ may be ascribed to the π -complex. According to A. N. Terenin et al. (Ref. 10: Optika i spektroskopiya, 3, 480 (1957); Izv. AN SSSR, OKhN, 1958, 1100), the frequency of the valency formation decreases by 115-195 cm^{-1} in the complex formation from cyclohexane and SnCl_4 ; besides, absorption bands appear in the region 1400-1340 and 1200 cm^{-1} . The band 1525 cm^{-1} in systems (d) and (e) is ascribed to the reduced (by 140 cm^{-1}) frequency of vibrations of the double bond in the π -complex of the dimer with the tin halides. In contrast to systems (a) and (b), the authors had not found any indications of a formation of π -complexes in system (c). The solutions of the latter in benzene are colorless, and no changes were observed in their infrared spectrum as compared with the spectra of components. Thus, the authors proved that the above-mentioned order was also maintained in the case of complexes with monomers. They conclude that $\text{C}_6\text{H}_5\text{SnCl}_3$ can also be a catalyst for the polymerization of olefins whereas this cannot be expected for $(\text{C}_6\text{H}_5)_2\text{SnCl}_2$. There are 3 figures, 1 table, and 10 references: 5 Soviet-bloc and 5 non-

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Soviet-bloc. The 4 references to English-language publications read as follows: Ref. 1: P. H. Plesh, Cationic Polymerisation and Related Complexes, London, 1953; Ref. 6: N. Shappard, D. M. Simpson, Quart. Rev., 6, 1 (1952); Ref. 8: A. G. Evans et al., J. Chem. Soc., 2975, 1957, 105; 1956, 2757; 1955, 1524; Ref. 9: G. E. Coates, L. E. Sunou, J. Chem. Soc., 1942, 567.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

SUBMITTED: December 23, 1960

X

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GOL'DSHTEYN, I.P.; GUR'YANOVA, Ye.N.; KOCHESHKOV, K.A.

Molecular compounds of tin tetrachloride with organic sulfides.
Dokl.AN SSSR 138 no.5:1099-1102 Je '61. (MIRA 14:6)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova. 2. Chlen-
korrespondent AN SSSR (for Kocheshkov).
(Tin organic compounds)

GUR'YANOVA, Ye.N.; GOL'DSHEYN, I.P.

Dielectric polarization method for donor-acceptor type complexes.
Zhur. ob. khim. 32 no.1:12-16 Ja '62. (MIRA 15:2)
(Complex compounds--Dipole moments)

S/079/62/032/001/011/016
D204/D302

AUTHORS: Gol'dshteyn, I.P., Gur'yanova, Ye.N., and
Kocheshkov, K.A.

TITLE: Polar properties of complexes of SnCl_4 with unsaturated compounds

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 1, 1962, 317-318

TEXT: Dipole moments of unsaturated organic compounds in benzene solutions with and without SnCl_4 were measured by dielectrometric titration to determine the nature of the bonds between the adducts, as such complexes are of interest in polymerization processes catalyzed by metal halides. Dipole moments of octene-1, styrol, stilbene and 1,1-diphenyl ethylene were only increased by 0.8-1D in the presence of 0.05-0.1 M SnCl_4 , which formed π -complexes with the hydrocarbons, as opposed to a typical increase of 3-5 D in complexes of the donor-acceptor type. Complexes of SnCl_4 with thiophan and tetrahydrofuran (class I) showed marked increases (~ 2.2 and Card 1/2 ✓

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3.7 D), whilst the dipole moments of those with furan and thiophen (class II) were only increased by ~ 1.2 and 0.3 D. It was, therefore, concluded that complexes I are of the donor-acceptor type whilst complexes II utilize the π -electrons. Reduction in the basic properties of O and S in furan and thiophen is ascribed to the neighboring double bonds. Further work is in progress. There are 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: H. Plesh, Catalytic polymerization and related complexes, London, 1953. ✓

ASSOCIATION: Fiziko-khimicheskiy institut imeni Karpova (Physico-Chemical Institute imeni Karpov)

SUBMITTED: March 31, 1961

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38579

3/081/62/000/010/044/085
3168/3180

15.9204

AUTHORS: Gur'yanova, Ye. M., Vasil'yeva, V. I.

TITLE: The structure of polysulfides and the strength of S-S bonds

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 10, 1962, 168-169, abstract 10Zh6 (Sb. "Khimiya seraorganich. soyedineniy, soderzhashchikh v neftyakh i nefteproduktakh. v. 4". M., Gostoptekhizdat, 1961, 24-33)

TEXT: The dipole moment and isotope dilution methods were used to study the structure of disulfides and polysulfides and the strength of the S-S bonds in these compounds. It was found that, irrespective of the composition and structure of R, all disulfides of the RSSR type, in which R is an alkyl (from CH₃ to C₁₈H₃₇), an aryl or an aralkyl, have practically identical dipole moments μ (in C₆H₆ at 15.25 and 40°C) of ~ 2.0 D. Under these conditions therefore there is no free rotation of RS groups round the S-S bond and that all the disulfides, both in the crystalline and liquid states as well as in solution, have a configuration in which the C-S bonds are arranged in different planes. This config-
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uration is due to mutual repulsion of the unshared $3p_z^2$ electron pairs of neighboring sulfur atoms. Stability of the spatial configuration independently of the structure of R, was also found in all the trisulfides ($\mu \approx 1.65$ D) and tetrasulfides ($\mu \approx 2.1-2.2$ D) investigated. Investigation of the reaction in which RS groups were exchanged between disulfides marked with S^{35} and mercaptans or thiophenols (Cf. RZhKhim, no. 4, 1955, 5308; no. 7, 1956, 18790), carried out in dry non-polar solvents (C_6H_6 , xylene, decalin), it was found that it was greatly accelerated by UV light; the presence of radicals in the solutions of certain disulfides was proved by means of a solution of diphenylpicrylhydrazyl. The E (act.) was measured of exchange reactions of certain marked disulfides with various mercaptans, and was found to be independent of the nature of the mercaptan, being entirely determined by the properties of the disulfide. The exchange reactions investigated thus take place by the mechanism of unbranched chain reactions, the limiting factor being the dissociation of disulfides into the RS radicals, i.e. breaking of the S-S bond. On this basis, and also on the assumption

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that there is little difference between the E (act.) of the reaction which continues the chain that of the recombination of the radical, the energy values of the S-S bonds in the disulfides were determined as double the E (act.) of the exchange reactions. The disulfide, the mercaptan (or thiophenol) the temperature in °C and the energy of the

S-S bond in kcal are now given: $(C_4H_9)_2S_2^{35}$, C_4H_9SH , 169-231, 58;
 $(C_8H_{17})_2S_2^{35}$, $C_8H_{17}SH$, 176-240, 60; $(C_{14}H_{29})_2S_2^{35}$, $C_{14}H_{29}SH$, 160-199, 58;
 $(C_{18}H_{37})_2S_2^{35}$, $C_{18}H_{37}SH$, 180-204, 60; $(C_6H_5CH_2)_2S_2^{35}$, $C_6H_5CH_2SH$, 180-227,
62; $(C_6H_5)_2S_2^{35}$, C_6H_5SH , 35-80, 20; $(n-CH_3C_6H_4)_2S_2^{35}$, $n-CH_3C_6H_4SH$,
93-142, 26; $(n-CH_3OC_6H_4)_2S_2^{35}$, $n-CH_3OC_6H_4SH$, 101-164, 29;
 $(n-C_6H_5C_6H_4)_2S_2^{35}$, $n-C_6H_5C_6H_4SH$, 110-160, 29; $(n-NO_2C_6H_4)_2S_2^{35}$,
 $n-NO_2C_6H_4SH$, 104-145, 46. The data obtained show that in all the

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aliphatic and aliphatic-aromatic disulfides the strength of the S-S bonds is practically the same, whereas in the aromatic disulfides the energy values of the S-S bonds are much lower; introduction of substitutes into the para position of the phenyl rings strengthens the S-S bond of aromatic disulfides. The difference in the strength of the S-S bonds of aliphatic and aromatic disulfides is due to the different energy value of stabilization of the RS radicals which form; the greater stability of radicals with an aromatic R is due to interaction between the unpaired p-electron of the sulfur atom and the system of π -electrons of the aromatic ring. A similar regularity was found in the influence of R on the strength of the S-S bonds and also in the polysulfides in the case of the reaction of isotope exchange between them and elemental sulfur (cf. RZhKhim, no. 4, 1955, 5309). The polysulfide, the temperature in °C and the E (act.) in kcal are given as: $(C_2H_5S)_2S^{35}$, 130-170, 27.5;

$(C_2H_5S)_2S_2^{35}$, 110-160, 24; $(n-CH_3C_6H_4S)_2S^{35}$, 80-130, 14.5;

$(n-CH_3C_6H_4S)_2S_2^{35}$, 80-130, 11.5; $(C_4H_9S)_2S_3^{35}$, 115, $k = 0.6 \cdot 10^{-4}$;

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$(C_6H_5CH_2S)_2S^{35}$, 110, no exchange (150, exchange); $(n-CH_3C_6H_4SO_2)_2S$,
140, no exchange. The authors consider that RS group exchange reactions
are very important because they can take place in more complex systems:
albumens, vulcanized rubbers, sulfur-base petroleum and petroleum products.
Abstracter's note: Complete translation.]

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GUR'YANOVA, Ye.N.; GOL'DSHTEYN, I.P.; PRILEZHAYEV, Ye.N.; TSYMBAL, L.V.

Structure of some α, β -unsaturated sulfur compounds based on data provided by dipole moments. Izv. AN SSSR. Otd.khim.nauk no.5:810-812 My '62. (MIRA 15:6)

1. Fiziko-khimicheskiy institut im. L. Ya. Karpova i Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Sulfur organic compounds—Dipole moments)

S/020/62/144/003/020/030
B119/B101

AUTHORS: Gol'dshteyn, I. P., Gur'yanova, Ye. N., and Kocheshkov, K. A.,
Corresponding Member AS USSR

TITLE: Complexes of tin tetrachloride with unsaturated compounds
containing heteroatoms

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 3, 1962,
569-572

TEXT: The complex formation of SnCl_4 with furan, 2-methyl furan, thiophene, and diallyl sulfide was studied. The results were compared with those obtained applying SnCl_4 to analogous saturated compounds (tetrahydrofuran, tetrahydrothiophene, 2,5-dimethyl thiophene, and dipropyl sulfide). The change in the dielectric constant and in the density of SnCl_4 solutions in benzene and hexane (0.05 - 0.08 g-moles/liter) was measured with small amounts of the above-mentioned substances successively added. Where appropriate the method of cryoscopic titration was used. (Results

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on infrared spectroscopic studies will be published soon.) With two possible reaction centers in the organic molecule, SnCl_4 in extreme cases gives rise, either to complexes of the donor-acceptor type (diallyl sulfide) or to π -complexes (furan, thiophene, 2-methyl furan). Intermediate types are possible, depending on the molecule structure. The presence of two C atoms in sp^2 state close to the heteroatom in the organic molecule suppresses its ability to form donor-acceptor complexes with SnCl_4 . The saturated compounds form stable complexes of the donor-acceptor type (SnCl_4 : donor = 1:1 and 1:2). When π -complexes are formed, SnCl_4 is a suitable as polymerization catalyst. There are 3 figures and 1 table. The most important English-language references are: P.H. Plesh, Cationic Polymerisation and Related Complexes, London, 1953. A. G. Evans, J. Lewis, J. Chem. Soc., 1957, 2975; A. G. Evans, R. M. Jones, J. H. Thomas, J. Chem. Soc., 1957, 105; A. G. Evans, N. Jones et al., J. Chem. Soc., 1956, 2737.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physiochemical Institute imeni L. Ya. Karpov)

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S/020/62/144/003/020/030
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SUBMITTED: February 22, 1962

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GOL'DSHTEYN, I.P.; IL'ICHEVA, Z.F.; SLOVOKHOTOVA, N.A.; GUR'YANOVA, Ye.N.;
KOCHESHKOV, K.A.

Spectroscopic investigation of complexes formed by thiophene
and thiophene with tin tetrachloride. Dokl. AN SSSR 144 no.4:
788-791 Je '62. (MIRA 15:5)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova. 2. Chlen-
korrespondent AN SSSR (for Kocheshkov).
(Thiophene—Spectra) (Tin chlorides)

ZOL'DSHEYN, I.P.; ALPATOVA, N.M.; KESSLER, Yu.M.; GUR'YANOVA, Ye.N.;
GORBANEV, A.I.

Interaction of hydrogen chloride, tetra-*n*-butyl ammonium chloride
with trimethylchlorosilane in benzene solutions. Izv. AN SSSR.
Ser.khim. no.9:1683-1685 S '63. (MIRA 16:9)

1. Institut elektrokhemii AN SSSR.
(Ammonium compounds) (Silane) (Hydrochloric acid)

GUR'YANOVA, Ye.N.; GRISHKO, N.I.

Structure of iso- and terephthalates by the method of dipole moments.
Zhur.strukt.khim. 4 no.3:368-371 My-Je '63. (MIRA 16:6)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova, Novomoskovskiy
filial, i Gosudarstvennyy proyektnyy i nauchno-issledovatel'skiy
institut azotnoy promyshlennosti, Novomoskovsk.
(Isophthalic acid--Dipole moments)
(Terephthalic acid--Dipole moments)

GUR'YANOVA, Ye.N.; BESKINA, I.G.

Molecular compounds of benzoic acid with amines. Zhur.ob.khim.
33 no.3:928-934 Mr '63. (MIRA 16:3)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova.
(Benzoic acid)
(Amines)

S/020/63/148/001/019/032
B101/B186

AUTHORS: Buchachenko, A. L., Gur'yanova, Ye. N., Kalashnikova, L.A.,
Neyman, M. B.

TITLE: Dipole moments of the diphenyl nitrogen oxide radical and
of the diphenyl hydroxylamine molecule

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 1, 1963, 95-96

TEXT: The molar polarization P_{∞} at infinite dilution and the molar
refraction R_D for the D line of sodium of $C_6H_5 - \overset{O}{\underset{|}{N}} - C_6H_5$ (I) and of
 $C_6H_5 - \overset{OH}{\underset{|}{N}} - C_6H_5$ (II) were determined in benzene at 25°C. The dipole moment
was calculated according to $\mu = 0.22 \sqrt{P_{\infty} - R_D}$. Data found for I: m.p. =
64°C, $P_{\infty} = 240.8$, $R_D = 55.8$, $\mu = 3.0 \cdot 10^{-18}$, and for II: m.p. = 60°C,
 $P_{\infty} = 91.8$, $R_D = 56.9$, $\mu = 1.3 \cdot 10^{-18}$. The discussion of these μ values
leads to the conclusion that no additivity exists and that μ for I cannot

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be calculated from μ for II. The difference between μ_I and μ_{II} is explained by interaction of the unpaired electron in I with the non-separated electron pair of the nitrogen atom; the oxygen atom cedes its partially occupied p orbit to one electron of this pair. Thus the oxygen atom receives a negative charge and the nitrogen atom a positive one. There is 1 table. The most important English-language reference is: Y. Deguchi, Bull. Chem. Soc. Japan, 34, 910 (1961). ✓

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR); Fiziko-khimicheskii institut im. L.Ya. Karpova (Physico-chemical Institute imeni L.Ya. Karpov)

PRESENTED: August 1, 1962, by V.N. Kondrat'yev, Academician

SUBMITTED: August 1, 1962

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KUTEPOVA, A.I.; GUR'YANOVA, Ye.N.; MAL'TSEVA, R.D.; GRUSHKO, N.I.;
KOMISSAROVA, G.I.; TSAREVA, V.N.

Diesters of isophthalic acid as plasticizers. Plast. massy
no.2:52-56 '64. (MIRA 17:8)

PRASHCHIKINA, A.S.; GUE'YANOVA, Ye.N.; GRINBERG, A.Ye.

Radical nature of degradation of a number of organosulfur compounds, accelerators of rubber plasticization. Vysokom. (MIRA 17:5)
soed. 6 no.1:112-117 Ja'64.

1. Nauchno-issledovatel'skiy institut rezinovykh i lateksnykh izdeliy i Fiziko-khimicheskiy institut imeni Karpova.

PAYZULLINA, N.K.; GUR'YANOVA, Ye.N.

Dipole moments of mercury bromide complexes with organic
sulfides. Zhur. ob. khim. 34 no. 3:941-946 Mr '64.
(MIRA 17:6)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova i Institut
organicheskoy khimii Bashkirskogo filiala AN SSSR.

CHERNTSOV, O.M.; CHALYKH, F.A.; GUR'YANOVA, Ye.N.

Derivatives of 2-mercaptobenzothiazole and dithiocarbamic acids. Part 2: Transformations of benzothiazolyl esters of dithiocarbamic acids. Zhur. ob. khim. 34 no. 3:952-955
Mr '64. (MIRA 17:6)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

ARZAMANOVA, I.G.; GUR'YANOVA, Ye.N.; GOL'DSHEYN, I.P.

Determination of the thermodynamic constants of molecular compounds
by means of dielectrometric titration. Dokl. AN SSSR 155 no.6;
1391-1393 Ap '64. (MIRA 17:4)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova. Predstavleno
akademikom S.S.Medvedevym.

ZEMLYANSKIY, N. N.; GOL'DSHTEYN, I. P.; GUR'YANOVA, Ye. N.; PANOV, Ye. M.; SLOVOKHO-TOVA, N. A.; KOCHESHKOV, K. A.

Structure of compounds with a stannoxane bond studied by means of dipole moments and infrared spectra. Dokl. AN SSSR 156 no. 1:131-134 My '64. (MIRA 17:5)

1. Fiziko-khimicheskiy institut im. L. Ya. Karpova. 2. Chlen-korrespondent AN SSSR (for Kocheskhov).

ISMAYLOV, Kh.M., GUR'YANOVA, Ye.N.

Dipole moments of alkyl-substituted thiophenols. Dokl. AN AzerbSSR
20 no.10:17-19 '64. (MIRA 18:2)

1. Fiziko-khimicheskiy institut im. Karpova i Institut neftekhimicheskikh
protssessov AN AzerbSSR.

OBOLENTSEV, R.D., prof., doktor khim. nauk, otv. red.; GAL'PERIN, G.D., doktor khim. nauk, red.; GUR'YANOVA, Ye.N., doktor khim. nauk, red.; MASHKINA, A.V., kand. khim. nauk, red.; PIVOVAROVA, T.Ye., kand. khim. nauk, red.; POZDEYEV, N.M., kand. fiz.-mat. nauk, red.; SOSKOVA, L.M., red. LEVINA, Ye.S., ved.red.

[Chemistry of the sulfur organic compounds in petroleum and petroleum products] Khimiya seraorganicheskikh soedinenii, sodержashchikhsia v neftiakh i nefteproduktakh. Moskva, Khimiia, 1964. 286 p. (MIRA 18:4)

1. Nauchnaya sessiya po khimii sera- i azotoorganicheskikh soyedineniy, sodержashchikhsya v neftyakh i nefteproduktakh. 7th, Ufa, 1963. 2. Institut organicheskoy khimii Bashkirskogo filiala AN SSSR (for Soskova, Obolentsev). 3. Fiziko-khimicheskii institut im. L.Ya.Karpova (for Gur'yanova).
4. Institut neftekhimicheskogo sinteza AN SSSR (for Gal'perin).

CHIRCHAYEVA, Ye.M.; AZOVSKAYA, V.A.; TAYLOR, I.A.; LEE, Y.-C.;
ANDRIANOVA, G.; SHOSTAKOVICH, N.F.

Diene condensation of divinyl sulfone, sulfoxide, and sulfide
with hexachlorocyclopentadiene. Zhur. ob. khim. 35 no.1:39-46
Ja '65. (MIRA 18:2)

L 3213-66 EWT(m)/EWP(j)/T/EWP(t)/EWP(b) IJP(c) JD/JN/RM

ACCESSION NR: AP5009223

S/0020/65/161/001/0111/011427

AUTHOR: Gol'dshteyn, I. P.; Gur'yanova, Ye. N.; Kocheshkov, K. A. ²⁶
(Corresponding member AN SSSR) ³

TITLE: Polarity and strength of intermolecular bonds in complexes of tin tetrachloride and organic sulfides ⁹

SOURCE: AN SSSR. Doklady, v. 161, no. 1, 1965, 111-114

TOPIC TAGS: polarity, intermolecular bond, tin compound, tin tetrachloride, sulfide, heat of formation, sulfur containing compound, dipole moment ²⁷

ABSTRACT: Measurements have been made of the heat of formation and dipole moments of complexes of tin tetrachloride with sulfur containing compounds. The dipole moments were determined by dielectrometric titration and the heats of formation by calorimetric titration. To obtain complexes with a 1:2 composition and a known cis-formation, compounds of the following type were used: $R-S-(CH_2)_n-S-R$ ($n = 1, 2, 3, 4, 5, 6$, or 10 , and $R = C_2H_5$ or C_4H_9). It was found that at small concentrations (0.03 g-mole/liter), compounds $SnCl_4 \cdot R-S-(CH_2)_n-S-R$, where $n = 1, 2$, or 3 , are monomers. Compounds

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L 3213-56

ACCESSION NR: AP5009223

with $n > 3$ are associated. Judging from the values of the dipole moments, such associated compounds have a cyclic structure. Experimental values of the heat of formation $-\Delta H$ (for one $\text{Sn} \dots \text{S}$ bond) and the dipole moments $\mu_{\text{Sn} \dots \text{S}}$ lie well on a straight line $\mu_{\text{Sn} \dots \text{S}} - (\Delta H_{\text{Sn} \dots \text{S}})$. Introducing a correction of ~ 1 kcal/mole into the experimental values of $-\Delta H$ to take account of the dissociation energy of the complex SnCl_4 from benzene, we can speak of a direct proportion between $-\Delta H_{\text{Sn} \dots \text{S}}$ and $\mu_{\text{Sn} \dots \text{S}}$. The above relationship is obviously general for n, σ -complexes of the donor-acceptor type. It appears that the bonds in compounds of this type are the result of an unshared electron pair in the donor molecule and of the vacant valence orbits in the acceptor molecule. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physicochemical Institute)

SUBMITTED: 030ct64

ENCL: 00

SUB CODE: IC, GC

NR REF SOV: 005

OTHER: 004

PC
Card 2/2

GOL'DENBERG, I.I.; KAY, N.M.; PRIGORIN, I.I.; SPIL'KO, Ye.N.;
MAY, Ye.F.; LITVINENKOVA, N.I.; KOCHESHKOV, A.S.

Organotin compounds of a new type. Dokl. AN SSSR 193
no.4:880-882, 1965. (MIRA 18:8)

1. Olden-boron, patent AN USSR (for Kocheshkov).

TUROVA, N.Ya.; GIRGOR'YEV, A.I.; NOVOSELOVA, A.V.; ANZAMANOVA, I.G.;
GUR'YANOVA, Ye.N.

Structure and properties of the complex compound
 $\text{BeCl}_2 \cdot \text{AlCl}_3 \cdot 3(\text{C}_2\text{H}_5)_2\text{O}$. Dokl. AN SSSR 164 no.3:590-593 S '65.
(MIRA 18:9)

1. Moskovskiy gosudarstvennyy universitet i Nauchno-issledovatel'-
skiy fiziko-khimicheskiy institut im. L.Ya. Karpova. 2. Chlen-
korrespondent AN SSSR (for Novoselova).

L 45232-65 EWT(m)/EPF(e)/EWP(j)/T/EWP(t)/EWP(b) PC-4/Pr-4 - IJP(s) ID/
ACCESSION NR: AT5008626 RM S/2933/61/007/000/0016/0083 38

AUTHORS: Arzamanova, I. G.; Gur'yanova, Ya. N. (Doctor of chemical sciences) 37

TITLE: Investigation of complexes of organic sulfides with iodine 37
E+1

SOURCE: AN SSSR. Bashkirskiy filial. Khimiya saraorganicheskikh soedineniy, soedozhashchikhaya v neftyakh i nefteproduktakh, v. 7, 1964, 75-83

TOPIC TAGS: organic compound, sulfide, dielectric constant, intermolecular bond, octane, dipole moment, iodine compound

ABSTRACT: The properties of a number of organic sulfide compounds with iodine were studied. The dielectric constant and the density of iodine solutions in an unpolarized solvent (octane) during successive small additions of the second component were measured. The experiments were carried out at 25°C with solution concentrations of 0.02-0.04 mole/liter. The organic sulfides were prepared chiefly at the IOKh BashFAN SSSR. Ya. N. Karaulova and N. P. Volynskiy of the Institut neftekhimicheskogo sinteza AN SSSR (Institute of Petroleum-Chemical Synthesis, AN SSSR) supplied some, and the remainder were synthesized by the authors. For iodine-thiophene and iodine-diethyl sulfide, it was found that, up to molar concentrations of 1:1 of the components, the dielectric constant increases
Carell/2

L 45232465

ACCESSION NR: AT5008626

sharply, meaning that molecular compounds with large dipole moments have formed. These dipole moments of complexes of the various alkyl sulfides with iodine proved to be nearly identical, which indicates that the polarity of the donor-acceptor bonds is approximately the same for all. Where differences were observed they may be due to the fact that the angle between the intermolecular bond S...I and the plane of the two S-C bonds in the sulfide molecule may vary (by 20-30°), depending on the length and structure of the alkyl radical. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Markova (Physico-Chemical Institute)

SUBMITTED: 00

ENGL: 00

SUB CODE: 00

NO REF SOV: 004

OTHER: 007

me
Car. 2/2

ACCESSION NR: APL009156

S/0190/64/006/001/0112/0117

AUTHORS: Prashchikina, A. S.; Gur'yanova, Ye. N.; Grinberg, A. Ye.

TITLE: The radical nature of breakup of a series of rubber plasticization organo-sulfur accelerators

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 1, 1964, 112-117

TOPIC TAGS: rubber, rubber plasticization, accelerator, organo sulfur accelerator, dibenzoyldisulfide, dibenzoylsulfide, diphenylpicrylhydrazyl, accelerator breakup, radical, radical breakup, mobile group

ABSTRACT: The plasticizing effect of derivatives of thiobenzoic acid was investigated to discover tendencies toward radical reactions and whether a breakup into radicals was essential for their performance. The exchangeability of RH groups was studied, using dibenzoyldisulfide (DBDS), tagged with the S³⁵ isotope, as the standard. Its interaction with dibenzoylsulfide, Zn-thiobenzoate, Ni-thiobenzoate, benzylthiobenzoate, and bis-thiobenzoatebenzilidene was studied, using equimolar ratios of 0.15 Mol/l solutions in toluene, at temperatures up to 140°C for 30 minutes. It was found that these accelerators readily enter into reactions. The experiment was repeated, using ethanol, acetone, isopropylbenzene, toluene, and benzine as
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ACCESSION NR: AP4009156

solvents (at 55C). Since polar solvents did not accelerate the reaction, its homolytic character was stressed. In order to find out whether the reaction proceeded via exchange of sulfur atoms or via RS groups, the same thiobenzoic acid derivatives were reacted with a solution of elementary radioactive sulfur in toluene, which showed that the reaction with DBDS proceeded only at 125C and at a very slow rate (amounting to only 10% within 2 hours). The next experiment was intended to prove the mobility of the thiobenzoyl radical. The thiobenzoic acid derivatives were reacted with a solution of diphenylpicrylhydrazyl (DPH) in benzene at 20-22C, the optical density of DPH being checked at a wave length of 520 m μ by means of a SF-4 spectrophotometer. The results showed that the activity of the various derivatives of thiobenzoic acid varied greatly, depending on their composition and the structure of R. Parallel experiments were conducted with natural rubber, which was plasticized at 80-90C for 7 minutes on rolls in the presence of 10⁻² Mol RS/kg of rubber, the resulting plasticity being determined in Muni's viscosity units at 100C. This supports the view that the activity of the particular plasticizer is directly related to the ease of radical breakup, as established by the reaction with DPH. Since Zn-thiobenzoate proved to be the most effective plasticizer, a number of Zn-mercaptides were tested for their plasticization activity towards rubber and their reactivity with DPH, which confirmed their close correlation. Orig. art. has: 2 charts and 1 table.

Card 2/3

ACCESSION NR: AP4009156

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovy*kh i lateksny*kh izdeliy
(Scientific Research Institute of Rubber and Latex Products); Fiziko-khimicheskiy
institut im. L. Ya. Karpova (Physical and Chemical Institute)

SUBMITTED: 22Aug62

DATE ACQ: 10Feb64

ENCL: 00

SUB CODE: CH

NO REF SOV: 005

OTHER: 001

Card 3/3

L 53(90-65) EWT(m)/EWP(j) -- Po-4 RM
 ACCESSION NR: AP5014161

UR/0080/65/038/005/1118/1121
 678.028

AUTHOR: Fel'dshteyn, M. S.; Beskina, I. G.; Gur'yanova, Y. P.

TITLE: Sulfenamide derivatives of 2-benzthiazole as vulcanization accelerators

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 5, 1965, 1118-1121

TOPIC TAGS: sulfenamide, 2-benzthiazole derivative, vulcanization accelerator, rubber vulcanization

ABSTRACT: The exchange of thicbenzthiazolyl radical between S^{35} -labeled di-2-benzthiazyl disulfide and *N*-cyclohexane (I) and *N,N*-dicyclohexyl-2-benzthiazosulfenamides (II) was studied in order to elucidate the mechanism of sulfenamide derivatives of 2-benzthiazole used as vulcanization accelerators. The activation energy of the (I) and (II) reactions are 15.0 and 16.5 kcal/mol, respectively. The rate of the radical exchange in reactions (I) and (II) depends upon concentration of sulfenamides which indicates that the S-N bond breaking is the rate limiting step in these reactions. The large difference in the radical exchange in reactions (I) and (II) is paralleled by a similar difference in vulcanizing activity with

Card 1/2

L 53870-65

ACCESSION NR: AP5014161

2

sulfenamides used in these two reactions. It is postulated that the difference in the action of sulfenylamide derivatives of 2-benzthiazole used as vulcanization accelerators is due to the difference in chemical reactivity of the amide radicals $\cdot\text{NHC}_6\text{H}_{11}$ and $\cdot\text{N}(\text{C}_6\text{H}_{11})_2$. Orig. art. has: 3 tables and 6 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry); Fiziko-khimicheskiy institut imeni L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 21Mar63

ENCL: 00

SUB CODE: CC, MT

NO REF SOV: 003

OTHER: 000

Card 2/2

GOL'DSHTEYN, I.P.; GUR'YANOVA, Ye.M.; KARPOVICH, I.R.

Calorimetric titration method for determining the heats of
formation and dissociation constants of molecular compounds.
Zhur. fiz. khim. 39 no.4:932-937 Ap '65.

(MIRA 19:1)

1. Fiziko-khimicheskiy institut imeni Karpova. Submitted Dec. 2,
1963.

TEL'DSHTeyN, M.S.; BESKINA, I.G.; GUR'YANOVA, Ye.N.

Mechanism underlying the action of 2-benzothiazole sulfenamide derivatives as vulcanization accelerators. Zhur. prikl. khim. 38 no.5:1118-1121 My '65. (MIRA 18:11)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i Fiziko-khimicheskiy institut imeni L.Ya. Karpova.

L 41316-66 EWT(m)/EWP(j) JW/RM

ACC NR: AP6024018 (N) SOURCE CODE: UR/0062/66/000/006/0979/0983

AUTHOR: Rozantsev, E. G.; Gur'yanova, Ye. N.

ORG: Institute of Chemical Physics, Academy of Sciences, SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR); Physicochemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: Some characteristics of the structure of free iminoxyl radicals of the piperidine series

SOURCE: AN SSSR. Izv. Ser khim, no. 6, 1966, 979-983

TOPIC TAGS: free radical, piperidine, heterocyclic base compound, HYDRIDE

ABSTRACT: In order to determine the spin and charge densities in free iminoxyl radicals, the authors studied the polar properties of these radicals and compared them with the properties of the corresponding hydrides. The dipole moments¹ (DM) of the compounds studied (2,2,6,6-tetramethyl-1-hydroxypiperidine, 2,2,6,6-tetramethylpiperidine-1-hydroxyl, 2,2,6,6-tetramethyl-4-oxopiperidine-1-hydroxyl, 2,2,6,6-tetramethyl-4-hydroxypiperidine-1-hydroxyl, nitrogen diphenyl oxide, and diphenylhydroxylamino) were measured at 25° in benzene and n-octane. The effect of the presence of an unpaired electron in the =NO· group on the dipole moment was determined. The distribution of the spin density of the unpaired electron was found to be 27% on the nitrogen atom and 73% on the oxygen atom. The most probable conformations of the heterocyclic rings of the

Card 1/2

UDC: 541.51+539.143+547.7

L 41316-66

ACC NR: AP6024018

free radical studied were established on the basis of the DM data. Orig. art. has:
1 figure.

SUB CODE: 07/ SUBM DATE: 01Feb64/ ORIG REF: 005/ OTH REF: 005

Card

2/2

bdh

GUR'YANOVA, Ye.Ye.; USHAKOV, P.V.

On the Ninth Pacific Scientific Congress in Bangkok and the marine littoral fauna of the Gulf of Siam. Zool.zhur. 37 no.10:1586-1591
O '58. (MIRA 11:11)

1. Zoologicheskiy institut AN SSSR (Leningrad).
(Pacific area) (Siam, Gulf of--Marine fauna)

MONAKHOV, N.I., inzh., glavnyy red.; TURIANSKIY, M.A., inzh., zam. glavnogo red.; BOGDAKH, V.A., inzh., red.; GUR'YASHKIN, P.I., red.; PETROVA, V.V., red.izd-va; KL'KINA, E.M., tekhn.red.

[Collection No.26 of consolidated cost indexes of farm buildings and structures to be used in revaluating capital assets] Sbornik no.26 ukрупnennykh pokazatelei stoimosti sel'skokhoziaistvennykh zdaniy i sooruzheniy dlia pereotsenki osnovnykh fondov. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit. materialam, 1959. 126 p. (MIRA 13:1)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.

(Farm buildings)

MONAKHOV, N.I., otv. za vypusk; GUR'YASHKIN, P.I., red.; RUDAKOVA, N.I.,
tekh. red.

[Collection no.2 of consolidated cost indices for residential public,
and administrative buildings and structures for revaluating capital
assets on collective farms] Sbornik no.2 ukрупnennykh pokazatelei
stoimosti zhilykh, kul'turno-bytovykh i administrativno-khoziaistven-
nykh zdani i sooruzhenii dlia pereotsenki osnovnykh fondov v kolkho-
zakh. Moskva, Gos. izd-vo lit-ry po stroit., arkh. i stroit. mate-
rialam, 1961. 224 p. (MIRA 14:8)

1. Russia(1923- U.S.S.R.) Gosudarstvennyi komitet po delam stroitel'-
stva.

(Farm buidings—Costs)

MONAKHOV, N.I.. inzh., otv. za vypusk; GUR'YASHKIN, P.I., inzh., red.;
RUDAKOVA, N.I., tekhn. red.

[Collection No.1 of consolidated indices of the cost of industrial buildings and structures for revaluating fixed assets on collective farms] Sbornik no.1 ukрупnennykh pokazatelei stoimosti zdani i sooruzhenii proizvodstvennogo naznachenia dlia pereztsenki osnovnykh fondov v kolkhozakh. Uтверzhen Gosudarstvennym komitetom Soveta Ministrov SSSR po delam stroitel'stva 11 ianvaria 1961 g. Moskva, Gos. izd-vo po stroit., arkhitekt. i stroit. materialam, 1961. 335 p. (MIRA 14:9)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.

(Collective farms--Valuation)

GUREYCHEV, M.V., inzh.

Automatic control and mechanization of production processes
at electric power plants of the Kalinin Electric Power System.
Energetik 8 no.2:1-3 F '60. (MIRA 13:6)
(Automatic control) (Kalinin--Electric power plants)

LYBY, J.; GURACOVA, D.

Use of the latex test in the serological diagnosis of tularemia.
Cesk. epidem. 13 no.5:267-270 S '64.

1. Katedra epidemiologie Lekarskej fakulty University Komenskeho,
Bratislava.

CZECHOSLOVAKIA

GURYCOVA, Darina; LYSY, Jan; Chair of Epidemiology, Medical Faculty, Comenius University (Katedra Epidemiologie Lekarskej Fakulty Univerzity Komenskeho), Bratislava.

"The Use of New Media for Cultures of Pasteurella Tularensis."

Bratislava, Biologia, Vol 21, No 7, 1966, pp 529 - 535

Abstract: Mc Coy's egg medium is not as sensitive in quantitative cultivation experiments as thioglycolate media. The sensitivity of thioglycolate media approximately equals that of GCBA media, but the incubation period for thioglycolate media is much shorter. (24 to 28 hours). Thioglycolate media are suitable for the diagnosis of tularemia. 2 figures, 1 Table, 9 Western, 3 Czech, 3 Russian references. (Manuscript received 6 Dec 65).

1/1

GUR'YENKO, F.Ya., general-mayor meditsinskoy sluzhby

Give constant attention to the health of pilots. Vest.
protivovozd.obor. no.4:39-41 An '61. (MIRA 14:7)
(AIR PILOTS--DISEASES AND HYGIENE)

Guryev A.A.

800/366-5995

Издательство «СЭН». Институт химической физики

Безалкогольные углеводороды в жидкой фазе; сборник статей (Окисление гидрo-
карбов в жидкой фазе; Коллекция статей) Москва, Изд-во АН СССР,
1959. 334 с. Статья вставлена. 2,200 копия напечатана.

Ed.: E. M. Smirnov; Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: E. M. Drus'manov; Tech. Ed.: I. P. Kus'min.

NOTE: This collection of articles is intended for chemists interested in hydrocarbon oxidation reactions, particularly for those specializing in petrochemical fields.

FOOTNOTES: This collection of 35 articles represents the results of investigations over a period of several years on problems of hypnosis on eidetic. The authors present their own theoretical and experimental data and also draw from current literature. No personalities are mentioned. References accompany most of the articles.

CHURCHY, A.A., and E.A. Shubina (Scientific Research Institute of Metals, Moscow, U.S.S.R.) "The Role of Metals in the..."

3

The authors discuss the necessity of preventing the acceleration liquid-phase oxidation of systems.

Lodigay, H.L. [REDACTED] Research Institute,
[REDACTED]. Fueling Metal Catalyst During the Oxidation
of Motor Oil With Catalysts

Adding ½ "MILITEK-330" and ¼ tributylphosphite inhibits the thermal oxidation of fuel in contact with metal by passivating the latter. Fuel with ¼ dialkylaluminum phosphites added has lower oxidative stability than additive-free fuels. The addition of

Barilov, P.P., M.S. Evsteev, and A.G. Semakova (Moscow State University, Leningrad, U.S.S.R.). Effect of Temperature and Oxygen on the Oxidation of Bulk Oil and Thin Oil Layers
A thin layer (10-25 μ) of select kerosene, petroleum underground intensive thermal cracking when oxidized at 250° by atmospheric oxygen. Oxidation is negligible in bulk amounts of the same oil. Oxidation in thin layers is considerable and gums are formed.

AVAILABLE: Library of Congress

7-29-68

01/81 12/81

L 12586-63 EWT(m)/BDS AFFTC/ASD
ACCESSION NR: AP3001498

S/0240/63/000/005/0024/0029

AUTHOR: Gur'yev, A. F. (Aspirant)

19
51
50
TITLE: Combined effect of neutron irradiation and high air temperature on animals

SOURCE: Gigiyena i sanitariya, no. 5, 1963, 24-29

TOPIC TAGS: fast neutron, irradiation, high air-temperature irradiation, medium blood change, radiation injury, neutron irradiation

ABSTRACT: In studying the working conditions of those exposed to radioactive substances in the oil industry, high temperature of surrounding air was suspected as an unfavorable factor in addition to ionizing radiation. This work investigates the effect of high air temperature on development of radiation injuries caused by fast-neutron fractional irradiation. Experiments were conducted on 20 male rabbits irradiated with a maximum tissue dose of .4 rads a week for a total dose of 8.6 rads. Some of these were subjected to high air temperatures of 37 to 39°C. Certain indices of red and white blood and of the coagulation system were found changed as shown graphically. Leucocytes and lymphocytes increase and the phagocytic activity of leucocytes decreases lengthening the heparine tolerance period. The combined action of high air
Card 1/2

L 12586-63

ACCESSION NR: AP3001498

temperature (37 to 39°C) and fast neutron fractional irradiation intensifies radiation injury development. High air temperature should be considered in planning protection for those working with fast-neutron sources. Orig. art. has: 3 figures.

ASSOCIATION: Kafedra obshechey gigiyeny Pervogo Moskovskogo ordena Lenina meditsinskogo instituta imeni I. M. Sechenova (Department of General Hygiene of the First Moscow Order of Lenin Medical Institute)

SUBMITTED: 31Mar62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: AM,NS NO REF SOV: 004 OTHER: 000

Card 2/2

PODGORNAYA, N.S.; GUR'YEV, A.G.

Some characteristics of the sheared conglomerate formation
in the Vorozovka Valley in the northern Yenisey
Ridge. Inform.sbor.VSEGEI no.40:17-28 '60. (MIRA 14:12)
(Vorogovka Valley--Conglomerate)

GUR'EV, A. I.
GUR'EV, A. I.

00000

1.5-89 551 508.72:511.579.4
Gur'ev, A. I. Oldiavlicheskiĭ printsip uvelicheniia mashtaba zapisi urovnei vody. [Hydraulic principle to increase the scale of registration of water levels.] *Meteorologiya i Gidrologiya*, Leningrad, No. 4-49 51, July/Aug. 1955. fig. 9 eqs. DWB—The author describes an apparatus for measuring evaporation from open reservoirs—namely a floating evaporimeter the principle of which can be used to determine the variation of water level at a given point or variations in the difference of the levels without the interruption of continuous mechanical devices. The apparatus is described with the aid of a diagram, its physical principles are analyzed mathematically, and the results of experimental tests are presented. *Author's Note*.—*ings*. 1. Evaporimeters 2. Water level variations.—I. L. D. HSC JH

S/137/62/000/007/009/072
A052/A101

AUTHORS: Favorskaya, L. V., Nikiforova, G. A., Gur'yeva, A. I.

TITLE: On the possibility of extracting scandium from wolframites and beryls

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1962, 26, abstract 70178 -
("Tr. Kazakhsk. n.-i. in-ta mineral'n. syr'ya", no. 5, 1961, 269 -
274)

TEXT: The possibility of extracting Sc from slags of Fe-W production was investigated. Up to 85% Sc can be extracted into solution from a slag ground by 80% to 200 mesh when decomposing the slag with 18% HCl solution, the temperature 80 - 90°C; the relation liquid phase : solid phase = 4 : 1. From the solution obtained Sc can be precipitated sufficiently fully by means of Na_2SiF_6 . Silico-fluoride precipitate, after being hydrated with 40% NaOH, contains 6 - 8% Sc_2O_3 . To extract Sc from beryl the calcium sulfate method of processing was used. After melting beryl, sulfating and lixiviating the melt, a solution was obtained containing ~25 g/l BeO, 36 g/l Al_2O_3 and ~90 mg/l Sc_2O_3 . The losses of Sc with

Card 1/2

On the possibility of...

S/137/62/000/007/009/072
A052/A101

alumcammonia alum precipitated from the solution are $\sim 5\%$. After evaporating the solution, BeSO_4 crystallizes out and Sc and Fe remain in the solution. When precipitating $\text{Fe}(\text{OH})_3$ with the excess of 40% NaOH a co-precipitation of Sc takes place. The obtained Fe precipitate contains 1.9% Sc_2O_3 when completely extracted from the solution. Sc can be separated from Fe by precipitating oxalates in the presence of a large amount of Ca.

L. Vorob'yeva

[Abstracter's note: Complete translation]

Card 2/2

GUR'YEV, A. M.; BOGATYREV, YE. F.

"Fusing Hard Alloy Blades to Cutter Shanks by High-Frequency Currents," Stanki
I Instrument, 16, No. 6, 1945

BR-52059019

GUR'YEV, A.N.

Treatment of staphylogenic sycosis. Vest. dermat. i ven. 34 no.4:
48-50 '60. (MIRA 13:12)
(HAIR--DISEASES) (STAPHYLOCOCCAL INFECTIONS)

GJR'YEV, A.N. (Leningrad)

Diapason measurement of thermoreception of the cutaneous analyzer
in patients with staphylogenic sycosis. Vest.derm.i ven. 35
no.5:33-35 Ap '61. (MIRA 14#5)
(HAIR--DISEASES) (STAPHYLOCOCCAL INFECTIONS)
(TEMPERATURE SENS)

GUR'YEV, A.N., kand.med.nauk; LISOVSKAYA, N.D., kand.med.nauk; SKRIPKIN, Yu.K.;
SOMOV, B.A.; GOL'DBERG, D.M.; LEBEDEV, B.M.

New drugs. Vest. derm. i ven. 38 no.9:78-79 S '64.

(MIRA 18:4)

GUR'YEV, A.V.; ROMANENKO, A.F.; SERGEYEV, G.A.

Filtration of random processes. Radiotekhnika 19 no.1:63-70
Ja '64. (MIRA 17:1)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni Popova.

GUR'YEV, A.V.; ROMANENKO, A.F.; SERGEYEV, G.A.

Properties of a generalized smoothing operator. Radiotekhnika
19 no.2:67-72 F '64. (MIRA 17:6)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni A.S. Popova.

GUR'YEV, A. V.

"Investigation of Lateral Deformations." Cand Tech Sci, Leningrad Order of Lenin Inst of Railroad Transport Engineers imeni Academician V. N. Obraztsov, Leningrad, 1954. (KL, No 15, Apr 55)

SO: Sum. No. 704, 2 Nov 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (16).

FD-1039

USSR/ Metallurgy - Deformation coefficient

Card 1/1 : Pub. 153 - 10/23

Author : Gur'yev, A. V.

Title : Coefficient of transverse deformation in the elastic region

Periodical : Zhur. tekhn. fiz., 24, 1441-1447, Aug -1954

Abstract : First part of an investigation in transverse deformation. Treats the variation of the coefficient with increasing stress and preliminary cold-working. Demonstrates this variation over a full load cycle. Reviews data of handbooks on Poisson coefficient. Explains the cause for such wide discrepancies. Shows the coefficient independent of carbon content in steel and necessarily identical for all carbon-steel alloys. Introduces a new constant reflecting the inhomogeneity of micro-volumes and the intensity of onset into the plastic state versus voltage increase. Thanks Prof. P. V. Melent'yev for posing this subject.

Institution : - -

Submitted : 21 November 1953

GUR'YEV, A. V.

USSR/Physics-Polycrystalline alloys

FD-1230

Card 1/1 Pub. 153-14/22

Author : Gur'yev, A. V.

Title : Theory of elastic deformation of a polycrystalline alloy

Periodical : Zhur. tekhn. fiz., 24, 1644-1659, Sep 1954

Abstract : Attempt is made to develop theory of deformation of polycrystalline alloy taking into consideration its inhomogeneous microstructure. A new constant is introduced called "modulus of plasticity." This constant is found to rise with increasing carbon content in steel. New formulas enable the plotting of deformation under load and the hysteresis loops without complicated tests. Author finds his formulas in agreement with experiments. Ten references.

Institution :

Submitted : February 1, 1954

GUR'EV, A.V.

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6776

Author : Gur'ev, A.V.

Inst : Stalingrad Mechanical Institute, USSR

Title : On the Coefficient of Transverse Deformation in the Plastic Region

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 3, 457-463

Abstract : The coefficient of transverse deformation in the plastic region was determined for structural steel. It was shown experimentally that in plastic tension, even for a round specimen, the deformation occurs in an extremely irregular manner over its volume. Compared with other investigations, a value of the coefficient that is closer to 0.5 was obtained.

Card : 1/1

GUR'YEV, A.V.

GUR'YEV, A.V.

Origin of elastic imperfections in a polycrystalline alloy.
A. L. Gur'yan, Mech. Inst., Stalingrad. Fiz. Metal. i
349-50 (1956). By

1. The origin of elastic imperfections in a polycrystalline alloy is a problem of great interest in the theory of plasticity.

2. It is known that in a polycrystalline alloy the elastic imperfections are concentrated in the grain boundaries.

3. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

4. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

5. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

6. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

7. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

8. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

9. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

10. The elastic imperfections in a polycrystalline alloy are concentrated in the grain boundaries.

GUR'YEV, A.V.

120-4-25/35

AUTHOR: Gur'yev, A.V.

TITLE: A High-accuracy Hydraulic Tensometer (Gidravlicheskiy
tensometr povyshennoy tochnosti)

PERIODICAL: Priory i Tekhnika Eksperimenta, 1957, No.4,
pp. 90 - 92 (USSR)

ABSTRACT: A hydraulic tensometer for measurement of the tensile strain of normal circular specimens is described. The tensometer has comparatively wide limits of measurement and is accurate and reliable in operation. The apparatus measuring scale is linear over the whole of its length (5 mm) and the value of each division is 0.1 μ . The tensometer consists of two separate parts (Fig.1) which are clamped to the specimen at a known distance apart. Two thumb-screws in the lower part are adjusted to press against plungers in the upper part, the plungers being connected to thin rubber diaphragms. Above the diaphragms is a liquid (glycerin) with a level indicator. When the specimen is strained, the plungers move downwards by the amount of the strain and the liquid level falls. A micrometer screw is turned to reduce the liquid space until the liquid level is restored. The micrometer scale indicates the specimen extension. The gain of the apparatus Card1/2 is 10 000, which enables exceedingly small strains within the

A High-accuracy Hydraulic Tensometer.

120-4-25/35

elastic limit to be measured, but the limits are wide enough for extension into the elasto-plastic region to be measured without re-setting the apparatus. Fig. 1 shows the constructional details: Fig. 2 is a photograph of the apparatus, and Fig. 3 shows some results obtained. There are 3 figures and 1 Slavic reference.

ASSOCIATION: Stalingrad Mechanical Institute
(Stalingradskiy mekhanicheskiy institut)

SUBMITTED: January 21, 1957.

AVAILABLE: Library of Congress

Card 2/2

AUTHOR:

Gur'yev, A.V.

SOV-115-58-4-16/45

TITLE:

A Precision Electric Tensometer for Measuring Transverse Deformations (Pretsizionnyy elektricheskiy tenzometer dlya izmereniya poperechnykh deformatsiy)

PERIODICAL:

Izmeritel'naya tekhnika, 1958, Nr 4, pp 31-32 (USSR)

ABSTRACT:

The tensometer was constructed at the Stalingradskiy mekhanicheskiy institut (Stalingrad Institute of Mechanics) for research into the transverse deformation of metals. It is of the capacitance-converter type with the following characteristics: graduation in 0.005 mu, upper measuring limit 10 mu, base 10 mm (according to the diameter of the object under test), power consumption 30 w. The device consists of a capacitance-converter pick-up with attachment clamp which also serves as a deformation doubler. Deformations in the metal cause shifts in the central plate of the pick-up, thereby altering the capacitance of the

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SOV-115-58-4-16/45

A Precision Electric Tensometer for Measuring Transverse Deformations

bridge. Voltages are fed from the bridge to the electronic unit where they are first amplified and then fed to a zero-indicating tube. The spread of the magic-eye indicator shows when the bridge is balanced and readings can be taken. The bridge is rebalanced when necessary by adjusting the knob of the compensating device. Calibration and constructional details are given. There are 2 diagrams and 1 Soviet reference.

1. Metals--Deformation
2. Tensiometers--Design

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18(7); 18(3)

AUTHOR:

Gur'yev, A. V.

SOV/163-58-4-33/47

TITLE:

On the Problem of Constancy of the Modulus of Normal Elasticity of Structural Steels (K voprosu o postoyanstve modulya normal'noy uprugosti konstruktivnykh staley)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 4, pp 193 - 196 (USSR)

ABSTRACT:

The present investigation was made for the purpose of determining the actual regularities in the change of the modulus of Yung in dependence on the carbon content in steel. The different carbon steels with different heat treatment: annealing, normalizing and quenching with tempering, were investigated. It was stated that the elastic modulus is a steadier value than was assumed hitherto. An increase in the elastic modulus with the number of stresses is apparently connected with the circumstance that local microplastic shifts can occur at the individual smallest grains or even within individual grains (Refs 7, 8). This leads to a redistribution of tensions causing a relief of the weak microvolumes and a taking over of the overload by stronger microvolumes. Simple empirical formulae are given here. They serve to

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On the Problem of Constancy of the Modulus of
Normal Elasticity of Structural Steels

SOV/163-58-4-33/47

determine the elasticity modulus if the steel hardness is known according to Rockwell (Rokvell) for the B-scale, or for the C-scale, respectively. The maximum error for these formulae is not higher than 0.35%. There are 4 figures, 2 tables, and 9 Soviet references.

ASSOCIATION: Stalingradskiy mekhanicheskiy institut (Stalingrad Institute of Mechanical Engineering)

SUBMITTED: October 1, 1957

Card 2/2

GUR'YEV, A.V.

Investigating transverse deformations in carbon steels. Fiz.
met. i metalloved. 6 no.4:725-733 '58. (MIRA 11:12)

1. Stalinskiy mekhanicheskiy institut.
(Steel--Testing) (Deformations (Mechanics))

AUTHOR: Gur'yev, A.V.

SOV/126-7-4-13/26

TITLE: On the Nature of the Variation of the Normal Elasticity Modulus with Increasing Deformation

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 4, pp 586-594 (USSR)

ABSTRACT: The theoretical analysis of the relationship between the modulus of elasticity and the degree of deformation, which forms the first part of the present paper, is based on the view that the non-elastic phenomena observed in all polycrystalline alloys and giving rise to the formation of closed hysteresis loop are associated mainly with plastic deformation taking place non-uniformly in the microvolumes of the alloy. On the basis of this theory, confirmed by the results of experiments carried out by Pavlov (Ref 2) and Rovinskiy (Ref 3), the present author derived in one of his earlier works (Ref 4) a set of equations for the strain-stress curves during loading (Eq 1), unloading (Eq 2) and repeated loading (Eq 3). In these equations, E_0 - modulus of the normal elasticity for pure elastic deformation which is regarded as a stress-independent

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SOV/126-7-4-13/26

On the Nature of the Variation of the Normal Elasticity Modulus with Increasing Deformation

constant of the material; π - a new constant of the material describing the intensity with which micro-volumes of the alloy enter the state of deformation with increasing stress; the reciprocal of π is numerically equal to the proportion of the cross-section of the specimen which becomes non-elastically deformed when the factual stress is increased by 1 kg/cm². σ_1 in Eq (2) denotes the starting value of the load during the unloading cycle. In the first paragraph of the present paper, the author derives expressions describing the relationship between the real values of the elasticity modulus, E , and relative deformation, ϵ . If $E = d\sigma/d\epsilon$ (Eq 4), then it follows from Eq (1) that during the first loading cycle

$$E = E_0 \sqrt{1 - 2 \frac{\sigma}{\pi}} \quad (5)$$

If E is expressed as a function of relative deformation, ϵ , then

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$$E = E_0 - \frac{E_0^2}{\pi} \epsilon \quad (6)$$

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On the Nature of the Variation of the Normal Elasticity Modulus
with Increasing Deformation

Consequently, the Eq (6) plotted in coordinates $E-\epsilon$ will be a straight line; the point of the intersection of this line with the axis of ordinates will give the value of E_0 , and the tangent of the slope of this line will be given by Eq (7). Correspondingly, for the repeated loading, Eq (8) and (10) are obtained. The intensity of the decrease of the value of $E(tg\beta)$ will be the same as during repeated loading. The theoretical stress-strain curves and the curves of the relationship between E and ϵ are shown in Fig 1 (curves 1 for the first loading cycle; curves 2 for unloading; curves 3 for repeated loading). In the first series of experiments described in paragraph (2), standard tensile test pieces (10 mm dia) of carbon steels (mark 10, 15, 20, 30, 40) and chromium steel (mark 20Х) were subjected to loads not exceeding the yield point and the variation of the elasticity modulus was studied. The strain was measured with an extensometer designed by the present author (Ref 5) and having a linear scale, each division of which corresponded to strain of one micron. No stable

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SOV/126-7-4-13/26

On the Nature of the Variation of the Normal Elasticity Modulus
with Increasing Deformation

hysteresis loops were obtained under these conditions and, after a few loading and unloading cycles, the strain-stress curve was (within the investigated range of stress) practically a straight line. Typical results (showing, incidentally, the accuracy of the experimental technique employed) are given in a table on p 589 under the following headings: load P , kg; extensometer readings (a - the actual reading, b - the difference between consecutive readings); modulus $E_0 \times 10^{-6}$ kg/cm²; modulus $E'_0 \times 10^{-6}$ kg/cm²; difference $\Delta E'_0 \times 10^{-6}$ kg/cm²; deviation from the mean value of E'_0 , %. The manner in which the next series of experiments was conducted was decided by several considerations. (1) The whole gauge length of a tensile testpiece is deformed plastically, only if it is stressed beyond the yield range (point B on the curve in Fig 2). (2) For a specimen stressed in this way, each subsequent loading-unloading cycle should give rise to the formation of stable hysteresis loops characterised (as follows from equations quoted in paragraph 1) by two parameters: E_0 and π , the latter

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SOV/126-7-4-13/26

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parameter reflecting the non-homogeneity in a real polycrystalline alloy in the sense that its individual microvolumes do not start to deform simultaneously. (3) A specimen stressed in this manner, however, could not be used for checking the validity of Eq (1) and (6) since they are applicable to specimens loaded for the first time only. On the other hand, if a specimen previously stressed beyond the yield range is subjected to alternating loading with a gradual, decreasing amplitude (Fig 3), such treatment will bring about relaxation of all the plastically deformed microvolumes. (This treatment is compared to demagnetisation of steel by application of gradually diminishing alternating magnetic field.) For practical reasons, the specimens used by the present author were subjected not to the symmetric cycle illustrated in Fig 3, but to a one-sided cycle with a constant mean stress. Fig 4 shows the σ versus ϵ (bottom) and E versus ϵ (top) curves for a specimen of steel mark 30, (1) - subjected to loads not exceeding the yield point; (2) - loaded for the first

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On the Nature of the Variation of the Normal Elasticity Modulus
with Increasing Deformation

time (after having been overloaded and subjected to the relaxation treatment as described above); (3) - unloaded; (4) loaded for the second time. Similar data for steel mark 20Kh are reproduced in Fig 5. Fig 6 shows the stress-strain curves and the variation of E with ϵ for steel mark 10 which, after the preliminary treatment, was (1) - loaded for the first time; (2) - loaded for the second time to $\sigma_{\max} =$ (a) 3220, (b) 2420, (v) 1610 and (g) 805 kg/cm². The fact that the straight lines representing the relationship between E and ϵ are parallel, i.e. that they are characterised by the same angle coefficient, is in agreement with Eq (9) and confirms that π is, in fact, a constant. The graphical method of determining this constant is described in paragraph (4). This can be done with the aid of a formula (Eq 13) and curves showing the variation of E with ϵ , such as are shown in Fig 7 for a specimen of steel mark 40 stressed below the yield point (curve 1) and loaded for the first (curve 2) and second (curve 3) time, after having been

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SOV/126-7-4-13/26

'On the Nature of the Variation of the Normal Elasticity Modulus
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overloaded and subjected to the relaxation treatment. The results of the investigation described in the present paper show that when closed hysteresis loops are formed, the relationship between E and ϵ is linear. The fact that the maximum value of E of the plastically deformed material is lower than that of undeformed material cannot be explained by the weakening of the inter-atomic forces alone. The present author shows analytically that this decrease in the value of E_{\max} is numerically equal to that portion of the cross-section area of the specimen which, at a given moment, is deformed non-elastically. Thus, in the case of a specimen that had been stressed above the yield range, subjected to the relaxation treatment and then stressed again within the elastic range, approximately 3% of the volume of the specimen can deform unelastically, even under comparatively small loads. There are 7 figures, 1 table and 9 references, 8 of which are Soviet and 1 English.

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SOV/126-7-4-13/26

On the Nature of the Variation of the Normal Elasticity Nodulus
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ASSOCIATION: Stalingradskiy mekhanicheskiy institut (Stalingrad
Mechanical Institute)

SUBMITTED: January 20, 1958

Card 8/8

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67770

AUTHOR: Gur'yev, A.V.

SOV/126-8-5-23/29

TITLE: Influence of Cold Plastic Deformation^{ab} on the Moduli of Elasticity^{ab} of Carbon Steels

PERIODICAL: Fizika metallov i metallovedeniye, Vol 8, 1959, Nr 5, pp 777-784 (USSR)

ABSTRACT: The author has previously shown (Ref 1) that the true value of Young's modulus E after plastic extension varies linearly with relative elastic deformation ϵ :

$$E = E_0 - (E_0^2/2\sigma)\epsilon \quad (1)$$

where E_0 is the initial value of E . The constant σ is called the modulus of microplasticity (Ref 2).

The author has used the static method for determining the moduli of elasticity in the present investigation. This showed that after any degree of plastic deformation changes of true moduli of elasticity form two distinct regions: a low-stress region with rapid decrease in moduli and the medium- and high-stress region with a linear dependence of decrease of the moduli. The first region the author attributes to the action of the weakened surface layer of the specimen in which plastic

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67770

SOV/126-8-5-23/29

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of Carbon Steels

shear can start at lower stresses. Increase in preliminary plastic deformation leads to a rise in the microplasticity modulus whose value indicates the state of conversion of elastic deformations into microplastic ones in individual microregions of the specimen: this is in line with the known hardening of an alloy after plastic deformation. The growth in the microplasticity modulus can be explained by decrease in block size, as revealed by X-ray methods. Plastic deformation produces practically no reduction in the initial values of Young's and shear moduli. For his investigations of Young's modulus the author used normal specimens with a diameter of 10 mm after the plastic elongation. Four types of carbon steel (St. 10, St. 15, St. 30 and St. 45) in the annealed and normalized states were tested by a previously described (Ref 1) method. The results for the St. 30 steel are shown in Fig 1 in the form of plots of the true Young's modulus against relative elastic deformation for different degrees of plastic deformation (Fig 2 gives the corresponding curves for St. 15 steel). ✓

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All the curves are seen to intersect at a single point. Fig 3 gives the linear plots for St. 30 steel which are obtained after the influence of the weakened surface layer has been excluded. The variation of the micro-plasticity coefficient with the degree of preliminary plastic deformation is shown in Fig 4. Shear moduli were determined for the above steels by the torsion method. Figs 5 and 6 show for steels St. 10 and St. 45, respectively, the true shear moduli as functions of relative elastic deformation for different degrees of plastic deformation. These curves are exactly analogous to those for Young's moduli. There are 6 figures, 1 table and 14 references, of which 13 are Soviet and 1 is English.

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ASSOCIATION: Stalingradskiy mekhanicheskii institut
(Stalingrad Mechanical Institute)

SUBMITTED: December 16, 1958

25(1), 28(2)

SOV/115-59-9-16/37

AUTHOR:

Gur'yev, A.V.

TITLE:

A Torsiometer of Higher Accuracy

PERIODICAL:

Izmeritel'naya tekhnika, 1959, Nr 9, pp 30-31 (USSR)

ABSTRACT:

The author describes a highly sensitive torsiometer for static torsion tests, having a linear dial over the entire wide range of torsional angles to be measured. This device was designed and built at the Stalingradskiy mekhanicheskii institut (Stalingrad Mechanical Institute). The graduation value is 0.0002 radian when using an indicator head with a graduation value of 0.01 mm. The maximum torsional angle which may be measured by this instrument with one setting is equal to 14° . The device is to be used when the deformations are relatively small, but may be also applied for measurements in the field of elastic-plastic deformations. The parts to be measured may have diameters of 9-11 mm. The author describes briefly the different parts of this device. There are 2 diagrams.

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77689
SOV/148-60-1-12/34

AUTHOR: Gur'yev, A. V.

TITLE: The Part Played by Heterogeneous Elastic Deformation
in Microregions of Carbon Steel During Strengthening
by Cold Plastic Deformation

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya
metallurgiya, 1960, Nr 1, pp 72-76 (USSR)

ABSTRACT: This is a qualitative and quantitative evaluation of the
part played by nonelastic deformation of microregions
of an alloy during strengthening of carbon steel, based
on investigation of the change of shape and size of
the loop of "elastic" hysteresis. It is established that
strengthening of metals by plastic deformation is
accompanied by strong fragmentation of blocks and the
growth of stresses of second and third type (V. M.
Golubkov, V. A. Il'yina, V. K. Kritskaya, G. V.
Kurdyumov, M. D. Perkas, Physics of Metals and

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Physical Metallurgy, 1957, 5, Nr 3, 465; D. M. Zlatoustovskiy, Ya. S. Umanskiy, Scientific Reports of Higher School, Metallurgy, 1958, Nr 1, 104). In the experimental part of the work the plastic deformation was produced by tension, whose advantage over other types of deformation, like drawing and torsion, is in the fact that the stress over the whole volume of the sample can be taken as constant. Four types of carbon steel (10, 15, 30, 45) were tested. Their chemical composition is as follows: Steel 10: 0.07-0.15% C; 0.35-0.65% Mn; 0.17-0.37% Si; max 0.045% S; 0.040% P. Steel 15: 0.12-0.20% C; 0.35-0.65% Mn; 0.17-0.37% Si; max 0.045% S; max 0.040% P. Steel 30: 0.27-0.35% C; 0.5-0.8% Mn; 0.17-0.37% Si; max 0.45% S; max 0.40% P. Steel 45: 0.42-0.50% C; 0.5-0.8% Mn; 0.17-0.37% Si; max 0.045% S; max 0.040% P. The samples were of such a diameter that, after plastic elongation to a def-

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formation

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inite dimension, its diameter was always 10 mm. The deformations, during elimination of the loops of "elastic" hysteresis, were measured with accuracy of 0.1 micron by a tensometer (a device for measuring deformation of loaded mechanism) previously described (A. V. Gur'yev, Apparatus and the Technique of Experiment, 1957, Nr 4, 90). The article gives the derivation of the formula for branches of hysteresis loop, taking into account the heterogeneity of deformation in separate microregions and the experimental confirmation of the agreement of theory with experimental results. An equation of the ascending branch of hysteresis loop (at repeated loadings) is as follows:

$$\epsilon = \frac{2\pi}{E_0} \left(1 - \sqrt{1 - \frac{\sigma}{\pi}} \right). \quad (1)$$

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where E_0 = initial value of Young's modulus, and
 Π = "modulus of microscopcity" (a new constant)
reflecting manifestation of materials of elastic
imperfections. The regions of microplastic deformations
begin to originate in the process of loading (still in
the elastic region), along the range of the weakest
and unfavorably oriented microvolumes. The true value
of Young's modulus (determined at any moment of
loading) is expressed by a partial derivative:

$$E = \frac{\partial \sigma}{\partial \epsilon}, \quad (2)$$

and function $E = f(\epsilon)$ is a straight line as follows
from Eq. (1):

$$E = E_0 - \frac{E_0^2}{2\Pi} \epsilon. \quad (3)$$

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